

# Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 15
Field	WATTENBERG	Well	W OLANDER 15
Installation	Olander Pad	Wellbore	W OLANDER 15 (PWB)

N  
GRID

## WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	17.00	0.00	0.00	17.00	S 0.00	W 0.00		0.00
KOP	1500.00	0.00	9.54	1500.00	S 0.00	W 0.00	0.00	0.00
End of Build	1821.29	6.43	9.54	1820.61	N 17.75	E 2.98	2.00	-17.70
End of Hold	6292.58	6.43	9.54	6263.82	N 511.23	E 85.92	0.00	-509.72
Target OLANDER 15 EP	7255.88	90.00	179.64	6899.82	S 58.14	E 101.82	10.00	59.84
T.D. & Target OLA...2mi	16934.03	90.00	179.64	6899.82	S 9736.10	E 162.86	0.00	9737.46

Jul-12-2017  
EMMA-2015 [2000.0-2020.0] Dip: 66.61 deg Field: 52203.1 nT  
Lat: N40 12 10.3680 Long: W105 1 31.6200 Elev: 5033.00 ft  
Magnetic North is 8.59 deg East of True North  
GRID North is 0.31 deg East of True North  
To correct azimuth from True to GRID subtract 0.31 deg  
To correct azimuth from Magnetic to GRID add 8.28 deg

<- West (Feet) : East (Feet) ->

-800 0 800  
Scale 1 cm = 400 ft

Surface 0.00 N 0.00 E

OLANDER 15 EP

1600

800

0

-800

-1600

-2400

-3200

Scale 1 cm = 400 ft

<- North(Feet)

-4000

-4800

-5600

-6400

-7200

-8000

-8800

-9600

-10400

Tie on - 0.00 Inc, 17.00 MD, 17.00 TVD, 0.00 VS

3DS Kick off Point - 0.00 Inc, 1500.00 MD, 1500.00 TVD, 0.00 VS

End of Build - 6.43 Inc, 1821.29 MD, 1820.61 TVD, -17.70 VS

Created by admin  
Date plotted 10-Oct-2017

Plot reference is W OLANDER 15 (PWB).  
Ref wellpath is W OLANDER 15 (PWP#1).  
Coordinates are in Feet reference OLANDER 15.  
True Vertical Depths are reference Rig Datum.  
Measured Depths are reference Rig Datum.  
Rig Datum: Planned Datum #1  
Rig Datum to Mean Sea Level: 5049.00 ft.  
Plot North is aligned to GRID North.

OLANDER 15 BH-2mi

W OLANDER 15 (PWB)

End of Hold - 6.43 Inc, 6292.58 MD, 6263.82 TVD, -509.72 VS

OLANDER 15 EP

S/C Kick off Point - 90.00 Inc, 7255.88 MD, 6899.82 TVD, 59.84 VS

OLANDER 15 BH-2mi

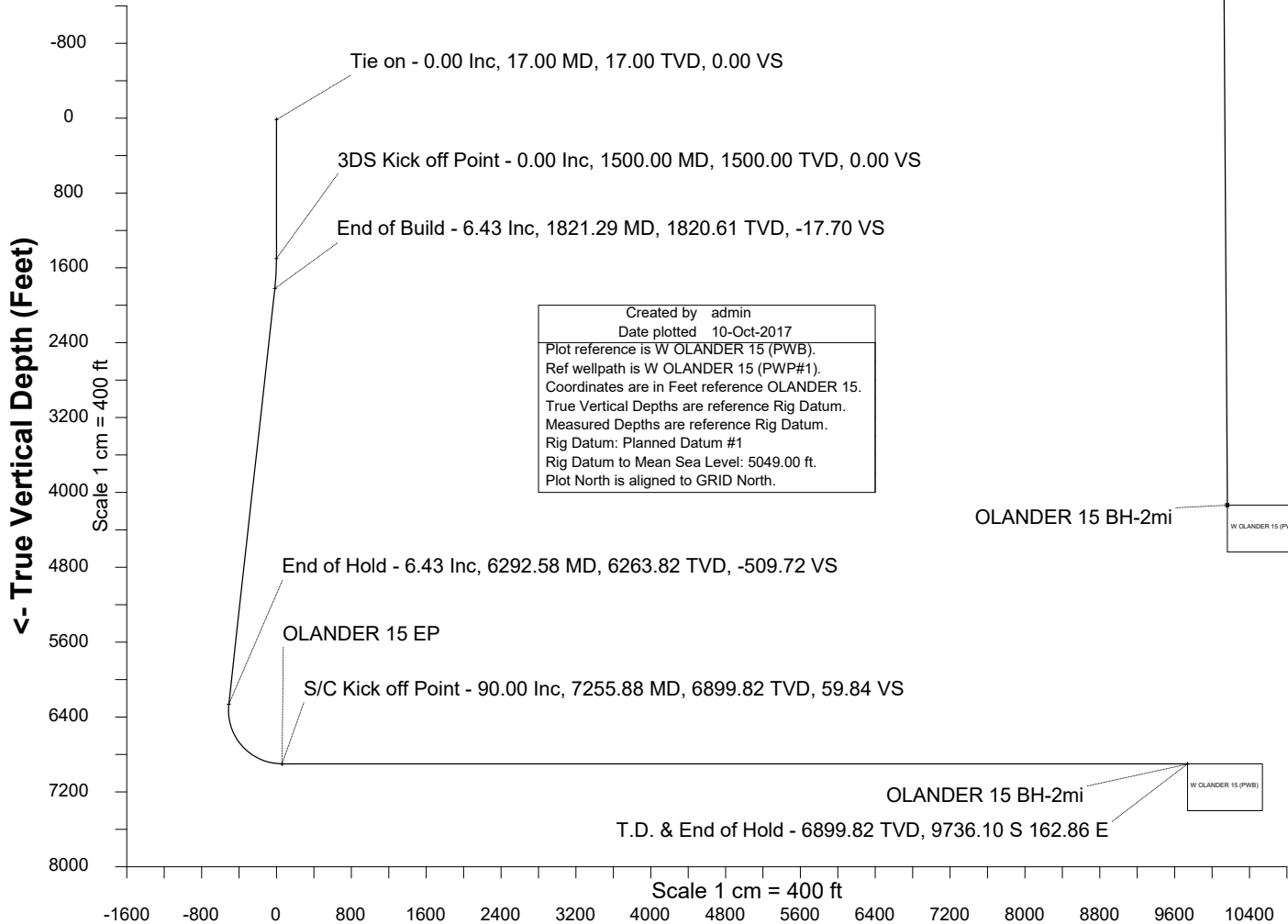
W OLANDER 15 (PWB)

T.D. & End of Hold - 6899.82 TVD, 9736.10 S 162.86 E

Scale 1 cm = 400 ft

Vertical Section (Feet) ->

Azimuth 179.04 with reference 0.00 N, 0.00 E from OLANDER 15





SYSDRILL  
Well Design Combined Report  
Wellbore: W OLANDER 15 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 15	40.20281000	-105.02535000	1317080.9236	3132578.8152	25.35S	28.07E	0.00

Declination		
Date	Source	Time
Jul-12-2017	EMM-2015 [2000.0-2020.0]	14:01

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Olander Pad	40.20288000	-105.02545000	1317106.2735	3132550.7471	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
17.00	0.00	0.000	17.00	0.00N	0.00E		0.00	1317080.92	3132578.82
1500.00	0.00	9.540	1500.00	0.00N	0.00E	==>	0.00	1317080.92	3132578.82
1821.29	6.43	9.540	1820.61	17.75N	2.98E	2.00	-17.70	1317098.67	3132581.80
6292.58	6.43	9.540	6263.82	511.23N	85.92E	==>	-509.72	1317592.13	3132664.73
7255.88	90.00	179.640	6899.82	58.14S	101.82E	10.00	59.84	1317022.78	3132680.63
16934.03	90.00	179.640	6899.82	9736.10S	162.86E	==>	9737.46	1307345.26	3132741.67

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	Rig Datum
17.00	0.00	0.000	17.00	0.00N	0.00E	==>	0.00	Slot Datum
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	
1500.00	0.00	9.540	1500.00	0.00N	0.00E	==>	0.00	
1517.00	0.34	9.540	1517.00	0.05N	0.01E	2.00	-0.05	
1617.00	2.34	9.540	1616.97	2.36N	0.40E	2.00	-2.35	
1717.00	4.34	9.540	1716.79	8.10N	1.36E	2.00	-8.08	
1817.00	6.34	9.540	1816.35	17.28N	2.90E	2.00	-17.23	
1917.00	6.43	9.540	1915.73	28.31N	4.76E	==>	-28.23	
2017.00	6.43	9.540	2015.10	39.35N	6.61E	==>	-39.23	
2117.00	6.43	9.540	2114.47	50.39N	8.47E	==>	-50.24	
2217.00	6.43	9.540	2213.84	61.42N	10.32E	==>	-61.24	
2317.00	6.43	9.540	2313.21	72.46N	12.18E	==>	-72.25	
2417.00	6.43	9.540	2412.58	83.50N	14.03E	==>	-83.25	
2517.00	6.43	9.540	2511.96	94.53N	15.89E	==>	-94.25	
2617.00	6.43	9.540	2611.33	105.57N	17.74E	==>	-105.26	
2717.00	6.43	9.540	2710.70	116.61N	19.60E	==>	-116.26	
2817.00	6.43	9.540	2810.07	127.64N	21.45E	==>	-127.27	
2917.00	6.43	9.540	2909.44	138.68N	23.31E	==>	-138.27	
3017.00	6.43	9.540	3008.82	149.72N	25.16E	==>	-149.27	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig ( Planned Datum #1 5049.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 179.040 degrees  
Bottom hole distance is 9737.46 Feet on azimuth 179.04 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Microsoft  
Date Printed: 10-Oct-2017



SYSDRILL  
Well Design Combined Report  
Wellbore: W OLANDER 15 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3117.00	6.43	9.540	3108.19	160.75N	27.02E	==>	-160.28	
3217.00	6.43	9.540	3207.56	171.79N	28.87E	==>	-171.28	
3317.00	6.43	9.540	3306.93	182.83N	30.72E	==>	-182.29	
3417.00	6.43	9.540	3406.30	193.86N	32.58E	==>	-193.29	
3517.00	6.43	9.540	3505.67	204.90N	34.43E	==>	-204.29	
3617.00	6.43	9.540	3605.05	215.94N	36.29E	==>	-215.30	
3717.00	6.43	9.540	3704.42	226.97N	38.14E	==>	-226.30	
3817.00	6.43	9.540	3803.79	238.01N	40.00E	==>	-237.31	
3917.00	6.43	9.540	3903.16	249.05N	41.85E	==>	-248.31	
4017.00	6.43	9.540	4002.53	260.08N	43.71E	==>	-259.32	
4117.00	6.43	9.540	4101.90	271.12N	45.56E	==>	-270.32	
4217.00	6.43	9.540	4201.28	282.16N	47.42E	==>	-281.32	
4317.00	6.43	9.540	4300.65	293.19N	49.27E	==>	-292.33	
4417.00	6.43	9.540	4400.02	304.23N	51.13E	==>	-303.33	
4517.00	6.43	9.540	4499.39	315.27N	52.98E	==>	-314.34	
4617.00	6.43	9.540	4598.76	326.30N	54.84E	==>	-325.34	
4717.00	6.43	9.540	4698.14	337.34N	56.69E	==>	-336.34	
4817.00	6.43	9.540	4797.51	348.38N	58.55E	==>	-347.35	
4917.00	6.43	9.540	4896.88	359.41N	60.40E	==>	-358.35	
5017.00	6.43	9.540	4996.25	370.45N	62.26E	==>	-369.36	
5117.00	6.43	9.540	5095.62	381.49N	64.11E	==>	-380.36	
5217.00	6.43	9.540	5194.99	392.52N	65.97E	==>	-391.37	
5317.00	6.43	9.540	5294.37	403.56N	67.82E	==>	-402.37	
5417.00	6.43	9.540	5393.74	414.60N	69.68E	==>	-413.37	
5517.00	6.43	9.540	5493.11	425.63N	71.53E	==>	-424.38	
5617.00	6.43	9.540	5592.48	436.67N	73.38E	==>	-435.38	
5717.00	6.43	9.540	5691.85	447.71N	75.24E	==>	-446.39	
5817.00	6.43	9.540	5791.23	458.74N	77.09E	==>	-457.39	
5917.00	6.43	9.540	5890.60	469.78N	78.95E	==>	-468.39	
6017.00	6.43	9.540	5989.97	480.82N	80.80E	==>	-479.40	
6117.00	6.43	9.540	6089.34	491.85N	82.66E	==>	-490.40	
6217.00	6.43	9.540	6188.71	502.89N	84.51E	==>	-501.41	
6317.00	4.04	15.540	6288.13	513.41N	86.37E	10.00	-511.89	
6417.00	6.21	169.390	6387.97	511.48N	88.32E	10.00	-509.93	
6517.00	16.15	175.800	6485.95	492.25N	90.34E	10.00	-490.67	
6617.00	26.13	177.380	6579.10	456.28N	92.37E	10.00	-454.68	
6717.00	36.13	178.120	6664.59	404.69N	94.35E	10.00	-403.05	
6817.00	46.12	178.570	6739.83	339.03N	96.22E	10.00	-337.37	
6917.00	56.12	178.890	6802.52	261.30N	97.92E	10.00	-259.63	
7017.00	66.12	179.150	6850.75	173.86N	99.41E	10.00	-172.17	
7117.00	76.11	179.360	6883.08	79.37N	100.63E	10.00	-77.68	
7217.00	86.11	179.560	6898.51	19.30S	101.55E	10.00	20.99	
7317.00	90.00	179.640	6899.82	119.27S	102.21E	==>	120.96	
7417.00	90.00	179.640	6899.82	219.26S	102.84E	==>	220.95	
7517.00	90.00	179.640	6899.82	319.26S	103.47E	==>	320.95	
7617.00	90.00	179.640	6899.82	419.26S	104.10E	==>	420.94	
7717.00	90.00	179.640	6899.82	519.26S	104.73E	==>	520.94	
7817.00	90.00	179.640	6899.82	619.26S	105.36E	==>	620.93	
7917.00	90.00	179.640	6899.82	719.25S	105.99E	==>	720.93	
8017.00	90.00	179.640	6899.82	819.25S	106.62E	==>	820.92	
8117.00	90.00	179.640	6899.82	919.25S	107.25E	==>	920.92	
8217.00	90.00	179.640	6899.82	1019.25S	107.88E	==>	1020.91	
8317.00	90.00	179.640	6899.82	1119.25S	108.51E	==>	1120.90	
8417.00	90.00	179.640	6899.82	1219.24S	109.15E	==>	1220.90	
8517.00	90.00	179.640	6899.82	1319.24S	109.78E	==>	1320.89	
8617.00	90.00	179.640	6899.82	1419.24S	110.41E	==>	1420.89	
8717.00	90.00	179.640	6899.82	1519.24S	111.04E	==>	1520.88	
8817.00	90.00	179.640	6899.82	1619.24S	111.67E	==>	1620.88	
8917.00	90.00	179.640	6899.82	1719.23S	112.30E	==>	1720.87	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig ( Planned Datum #1 5049.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 179.040 degrees  
Bottom hole distance is 9737.46 Feet on azimuth 179.04 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Microsoft  
Date Printed: 10-Oct-2017



SYSDRILL  
Well Design Combined Report  
Wellbore: W OLANDER 15 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9017.00	90.00	179.640	6899.82	1819.23S	112.93E	==>	1820.87	
9117.00	90.00	179.640	6899.82	1919.23S	113.56E	==>	1920.86	
9217.00	90.00	179.640	6899.82	2019.23S	114.19E	==>	2020.86	
9317.00	90.00	179.640	6899.82	2119.23S	114.82E	==>	2120.85	
9417.00	90.00	179.640	6899.82	2219.22S	115.45E	==>	2220.85	
9517.00	90.00	179.640	6899.82	2319.22S	116.08E	==>	2320.84	
9617.00	90.00	179.640	6899.82	2419.22S	116.71E	==>	2420.83	
9717.00	90.00	179.640	6899.82	2519.22S	117.34E	==>	2520.83	
9817.00	90.00	179.640	6899.82	2619.22S	117.97E	==>	2620.82	
9917.00	90.00	179.640	6899.82	2719.21S	118.61E	==>	2720.82	
10017.00	90.00	179.640	6899.82	2819.21S	119.24E	==>	2820.81	
10117.00	90.00	179.640	6899.82	2919.21S	119.87E	==>	2920.81	
10217.00	90.00	179.640	6899.82	3019.21S	120.50E	==>	3020.80	
10317.00	90.00	179.640	6899.82	3119.21S	121.13E	==>	3120.80	
10417.00	90.00	179.640	6899.82	3219.20S	121.76E	==>	3220.79	
10517.00	90.00	179.640	6899.82	3319.20S	122.39E	==>	3320.79	
10617.00	90.00	179.640	6899.82	3419.20S	123.02E	==>	3420.78	
10717.00	90.00	179.640	6899.82	3519.20S	123.65E	==>	3520.77	
10817.00	90.00	179.640	6899.82	3619.20S	124.28E	==>	3620.77	
10917.00	90.00	179.640	6899.82	3719.19S	124.91E	==>	3720.76	
11017.00	90.00	179.640	6899.82	3819.19S	125.54E	==>	3820.76	
11117.00	90.00	179.640	6899.82	3919.19S	126.17E	==>	3920.75	
11217.00	90.00	179.640	6899.82	4019.19S	126.80E	==>	4020.75	
11317.00	90.00	179.640	6899.82	4119.19S	127.43E	==>	4120.74	
11417.00	90.00	179.640	6899.82	4219.18S	128.07E	==>	4220.74	
11517.00	90.00	179.640	6899.82	4319.18S	128.70E	==>	4320.73	
11617.00	90.00	179.640	6899.82	4419.18S	129.33E	==>	4420.73	
11717.00	90.00	179.640	6899.82	4519.18S	129.96E	==>	4520.72	
11817.00	90.00	179.640	6899.82	4619.18S	130.59E	==>	4620.71	
11917.00	90.00	179.640	6899.82	4719.17S	131.22E	==>	4720.71	
12017.00	90.00	179.640	6899.82	4819.17S	131.85E	==>	4820.70	
12117.00	90.00	179.640	6899.82	4919.17S	132.48E	==>	4920.70	
12217.00	90.00	179.640	6899.82	5019.17S	133.11E	==>	5020.69	
12317.00	90.00	179.640	6899.82	5119.17S	133.74E	==>	5120.69	
12417.00	90.00	179.640	6899.82	5219.16S	134.37E	==>	5220.68	
12517.00	90.00	179.640	6899.82	5319.16S	135.00E	==>	5320.68	
12617.00	90.00	179.640	6899.82	5419.16S	135.63E	==>	5420.67	
12717.00	90.00	179.640	6899.82	5519.16S	136.26E	==>	5520.67	
12817.00	90.00	179.640	6899.82	5619.16S	136.89E	==>	5620.66	
12917.00	90.00	179.640	6899.82	5719.16S	137.53E	==>	5720.66	
13017.00	90.00	179.640	6899.82	5819.15S	138.16E	==>	5820.65	
13117.00	90.00	179.640	6899.82	5919.15S	138.79E	==>	5920.64	
13217.00	90.00	179.640	6899.82	6019.15S	139.42E	==>	6020.64	
13317.00	90.00	179.640	6899.82	6119.15S	140.05E	==>	6120.63	
13417.00	90.00	179.640	6899.82	6219.15S	140.68E	==>	6220.63	
13517.00	90.00	179.640	6899.82	6319.14S	141.31E	==>	6320.62	
13617.00	90.00	179.640	6899.82	6419.14S	141.94E	==>	6420.62	
13717.00	90.00	179.640	6899.82	6519.14S	142.57E	==>	6520.61	
13817.00	90.00	179.640	6899.82	6619.14S	143.20E	==>	6620.61	
13917.00	90.00	179.640	6899.82	6719.14S	143.83E	==>	6720.60	
14017.00	90.00	179.640	6899.82	6819.13S	144.46E	==>	6820.60	
14117.00	90.00	179.640	6899.82	6919.13S	145.09E	==>	6920.59	
14217.00	90.00	179.640	6899.82	7019.13S	145.72E	==>	7020.58	
14317.00	90.00	179.640	6899.82	7119.13S	146.35E	==>	7120.58	
14417.00	90.00	179.640	6899.82	7219.13S	146.99E	==>	7220.57	
14517.00	90.00	179.640	6899.82	7319.12S	147.62E	==>	7320.57	
14617.00	90.00	179.640	6899.82	7419.12S	148.25E	==>	7420.56	
14717.00	90.00	179.640	6899.82	7519.12S	148.88E	==>	7520.56	
14817.00	90.00	179.640	6899.82	7619.12S	149.51E	==>	7620.55	

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Bottom hole distance is 9737.46 Feet on azimuth 179.04 degrees from Wellhead  
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Prepared by Microsoft  
Date Printed: 10-Oct-2017



SYS DRILL  
Well Design Combined Report  
Wellbore: W OLANDER 15 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
14917.00	90.00	179.640	6899.82	7719.12S	150.14E	==>	7720.55	
15017.00	90.00	179.640	6899.82	7819.11S	150.77E	==>	7820.54	
15117.00	90.00	179.640	6899.82	7919.11S	151.40E	==>	7920.54	
15217.00	90.00	179.640	6899.82	8019.11S	152.03E	==>	8020.53	
15317.00	90.00	179.640	6899.82	8119.11S	152.66E	==>	8120.52	
15417.00	90.00	179.640	6899.82	8219.11S	153.29E	==>	8220.52	
15517.00	90.00	179.640	6899.82	8319.10S	153.92E	==>	8320.51	
15617.00	90.00	179.640	6899.82	8419.10S	154.55E	==>	8420.51	
15717.00	90.00	179.640	6899.82	8519.10S	155.18E	==>	8520.50	
15817.00	90.00	179.640	6899.82	8619.10S	155.81E	==>	8620.50	
15917.00	90.00	179.640	6899.82	8719.10S	156.45E	==>	8720.49	
16017.00	90.00	179.640	6899.82	8819.09S	157.08E	==>	8820.49	
16117.00	90.00	179.640	6899.82	8919.09S	157.71E	==>	8920.48	
16217.00	90.00	179.640	6899.82	9019.09S	158.34E	==>	9020.48	
16317.00	90.00	179.640	6899.82	9119.09S	158.97E	==>	9120.47	
16417.00	90.00	179.640	6899.82	9219.09S	159.60E	==>	9220.47	
16517.00	90.00	179.640	6899.82	9319.08S	160.23E	==>	9320.46	
16617.00	90.00	179.640	6899.82	9419.08S	160.86E	==>	9420.45	
16717.00	90.00	179.640	6899.82	9519.08S	161.49E	==>	9520.45	
16817.00	90.00	179.640	6899.82	9619.08S	162.12E	==>	9620.44	
16917.00	90.00	179.640	6899.82	9719.08S	162.75E	==>	9720.44	
16934.03	90.00	179.640	6899.82	9736.10S	162.86E	==>	9737.46	

All data is in Feet unless otherwise stated  
Coordinates are from Slot MD's are from Rig and TVD's are from Rig ( Planned Datum #1 5049.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 179.040 degrees  
Bottom hole distance is 9737.46 Feet on azimuth 179.04 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Microsoft  
Date Printed: 10-Oct-2017



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 15 EP	58.14S	101.82E	6899.82	40.20264890	-105.02498660	1317022.78	3132680.63
OLANDER 15 BH-2mi	9736.10S	162.86E	6899.82	40.17608240	-105.02495370	1307345.26	3132741.67

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562434	Planned	1517.00	1517.00	WdW Rate Gyro	Standard	
562433	Planned	16934.03	6899.82	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes